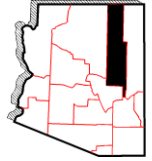




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## **SHORT VERSION OF CONVENTIONAL SEPTIC SYSTEM RULES FOR ON-SITE WASTEWATER TREATMENT FACILITIES JANUARY 1, 2001 (Reviewed 12/2008)**

Pursuant to the revised Aquifer Protection Permits Rule (Rule 18-9), Navajo County hereby publishes this shortened set of rules for **conventional systems** for understanding how the new septic system rules read, and the procedures required to obtain a septic system in Navajo County. **(Underlined italics added are not in rule)**

<b><u>INDEX</u></b>	<b><u>Page</u></b>
<b>Definitions .....</b>	<b>2</b>
<b>Notice of Intent to Discharge (Application for Septic System Permit) .....</b>	<b>3</b>
<b>Notice of Transfer .....</b>	<b>4</b>
<b>Facility Expansion .....</b>	<b>4</b>
<b>Notice of Intent to Discharge (Site Investigation Report Requirements) .....</b>	<b>4</b>
<b>Site Investigation .....</b>	<b>5</b>
<b>Facility Selection .....</b>	<b>8</b>
<b>Facility Design .....</b>	<b>9</b>
<b>Facility Installation and Operational Maintenance Plan .....</b>	<b>14</b>
<b>Tank Design, Manufacturing, and Installation .....</b>	<b>15</b>
<b>Transfer Inspection (Effective January 1, 2002) .....</b>	<b>18</b>

## **DEFINITIONS**

1. **“Aggregate”** means a clean graded hard rock, volcanic rock, or gravel of uniform size,  $\frac{3}{4}$  inch to 2  $\frac{1}{2}$  inches in diameter, offering 30% or more void space, washed or prepared to be free of fine materials that will impair absorption surface performance, and has a hardness value of three or greater on the Moh’s Scale of Hardness (can scratch a copper penny).
2. **“Clean water”** means water free of colloidal material or additives that could affect chemical or physical properties if the water is used for percolation testing or testing of seepage pit performance.
3. **“Design flow”** means the daily flow rate a facility is designed to accommodate on a sustained basis while satisfying all permit discharge limitations and treatment and operational requirements. The design flow incorporates peaking and safety factors to ensure sustained, reliable operation.
4. **“Direct reuse site”** means an area where reclaimed water is applied or impounded.
5. **“Disposal works”** means the system for disposing of treated wastewater generated by the treatment works of a sewage treatment facility or on-site wastewater treatment facility, by surface or subsurface methods.
6. **“On-site wastewater treatment facility”** means a conventional septic tank system or alternative system installed at a site to treat and dispose of wastewater, predominantly of human origin, generated at that site. An on-site wastewater treatment facility does not include a pre-fabricated, manufactured treatment works that typically uses an activated sludge unit process and has a design flow of 3000 gallons per day or more.
7. **“Setback”** means a minimum horizontal distance maintained between a feature of a discharging facility and a potential point of impact.
8. **“Sewage”** means untreated wastes from toilets, baths, sinks, lavatories, laundries, and other plumbing fixtures in places of human habitation, employment, or recreation.
9. **“Typical sewage”** means sewage in which the total suspended solids (TSS) content does not exceed 430 mg/l, the five-day biochemical oxygen demand (BOD) does not exceed 380 mg/l, and the content of fats, oils and greases (FOG) does not exceed 75 mg/l.
10. **“Type 4, General Permit”** means: Septic Tank With Disposal by Trench, Bed, Chamber Technology, or Seepage Pit, Less Than 3000 Gallons Per Day Design Flow. A 4.02 General Permit allows for a system consisting of a septic tank dispensing wastewater to an approved means of disposal described in Section E302. Only gravity flow of wastewater from the septic tank to the disposal field is authorized by this general permit.
  - 1) The standard septic tank and disposal field design specified in this general permit is intended to serve most sites where no site limitations are identified by the site investigation conducted under A310.
  - 2) If site conditions allow, this general permit authorizes the discharge of wastewater from a septic tank meeting the requirements of A314 to one of the following disposal fields:
    - a. Shallow trench,
    - b. Deep trench,
    - c. Bed,
    - d. Disposal field using chamber technology, or
    - e. Seepage pit.

## **NOTICE OF INTENT TO DISCHARGE (Application for Septic System Permit)**

### **A301.B.**

1. A person seeking a general permit for a Type 4 General permit shall submit, by certified mail, in person, or by another method approved by the Department, a **Notice of Intent to Discharge (Application for Septic System Permit)** on a form provided by the Department.
2. The Notice of Intent to Discharge (Application for Septic System Permit) shall include:
  - a) The name, address, and telephone number of the applicant;
  - b) The name, address, and telephone number of a contact person familiar with the operation of the facility;
  - c) The name, position, address, and telephone number of the owner or operator of the facility who has overall responsibility for compliance with the permit;
  - d) The legal description of the discharge areas, including the latitude and longitude coordinates;
  - e) A narrative description of the facility or project, including expected dates of operation, rate, and volume of discharge;
  - f) The information required for the general permit;
  - g) A listing of any other federal or state environmental permits issued for or needed by the facility, including any individual permit, Groundwater Quality Protection Permit, or Notice of Disposal that may have previously authorized the discharge; and
  - h) A signature on the Notice of Intent to Discharge certifying that the permittee agrees to comply with all requirements of this Article, including specific terms of the applicable general permit.
3. Receipt of a completed Notice of Intent to Discharge (Septic System Permit Application) by the Department begins the administrative completeness review.
4. The review process for completeness is 10 working days. The Department can request additional information from the designer and the Department will re-start the 10 day review window when the additional information is received.
5. When the application is determined to be complete and correct as to content for the system so designed, the Department will issue a notification of **Provisional Verification of General Permit Conformance** (a Septic System Permit).
6. Upon completion of the construction work and with submission of verification documents, as-builts, etc., the Department will issue a **Verification of General Permit Conformance** (a green tag).
7. **Verification Denial.** If, after receiving evidence of correction submitted by the person seeking to discharge, the Department determines that the deficiencies are not satisfactorily corrected, the Director shall notify the person of the Director's decision not to issue the Verification of General Permit Conformance and the person shall not discharge under the general permit. The notification shall inform the person of:
  - I. The reason for the denial with reference to the statute or rule on which the denial is based;
  - II. The person's right to appeal the denial, including the number of days the applicant has to file a protest challenging the denial and the name and telephone number of the Department contact person who can answer questions regarding the appeals process; and
  - III. The person's right to request an informal settlement conference under A.R.S. 41-1092.03(A) and 41-1092.06.

## **NOTICE OF TRANSFER**

**A304.A.** If a change of ownership occurs for a ...Type 4 General Permit facility, the permittee shall provide a Notice of Transfer to the Department by certified mail within 15 days after the date that ownership changes. The Notice of Transfer shall include:

1. Any information that has changed from the original Notice of Intent to Discharge,
2. Any other transfer requirements specified for the general permit, and
3. The applicable fee established in 18 A.A.C. 14.

**A304.B.** The Department may require a ...Type 4 General Permit permittee to submit a new Notice of Intent to Discharge and to obtain new verifications under A301.A, as applicable, if the volume or characteristics of the discharge have changed from the original application.

## **FACILITY EXPANSION**

**A305.** A Type 4 General Permit facility may be expanded contingent on review and verification by the Department of a new Notice of Intent to Discharge.

1. The person submitting the Notice of Intent to Discharge for the expansion may reference the previous Notice of Intent to Discharge if the previous information is identical, but shall provide full and detailed information for any changed items.
2. The Notice of Intent to Discharge shall include:
  - a) Any applicable fee established by 18 A.A.C. 14, and
  - b) A certification signed by the facility owner stating that the expansion continues to meet all of the requirements relating to the applicable general permit.
3. Upon receiving the Notice of Intent to Discharge, the Department shall follow the applicable review and verification procedures described in A301(A)(4).

## **NOTICE OF INTENT TO DISCHARGE (Site Investigation Report Requirements)**

**A309.B.** In addition to the Notice of Intent to Discharge requirements specified in A301(B), an applicant shall submit the following information in a format approved by the Department:

1. A site investigation report that summarizes the results of the site investigation conducted under A310(C), including:
  - a) Results from any soil evaluation, percolation test, or seepage pit performance test; and
  - b) Any limiting site conditions identified by the site investigation.
2. A site plan that includes:
  - 1) The parcel and lot number, if applicable, the property address or other appropriate legal description, the property size in acres, and the boundaries of the property on which the on-site wastewater treatment facility will be installed.
  - 2) A plan of the site drawn to scale, dimensioned, and with a north arrow that shows:
    - I. Proposed and existing on-site wastewater treatment facilities; dwellings and other buildings; driveways, swimming pools, tennis courts, wells, ponds, and any other paved, concrete, or water feature; and cut banks, retaining walls, and any other constructed feature that affects proper location, design, construction, or operation of the facility;
    - II. Any feature less than 200 feet outside the property boundary that constrains the location of the on-site wastewater treatment facility because of setback limitations specified in A312(C);
    - III. Topography, delineated with an appropriate contour interval, showing original and post-installation grades;

- IV. Location and identification of the treatment and disposal works and connecting pipelines, the reserve disposal area, and location and identification of all sites of percolation testing and soil evaluation performed under A310; and
  - V. Location of any public sewer if 400 feet or less from the property line.
- 3) For improvements in areas in which occupancy of property may depend on installation of a drinking water well and an on-site wastewater treatment facility, the location of features within the boundaries of each adjoining undeveloped property if setback requirements may mutually constrain well, cut bank, and on-site wastewater treatment facility locations.

**A309C.** Additional verification of general permit conformance requirements:

1. If the entire on-site wastewater treatment facility at the site, including treatment and disposal works, is permitted under the 4.02 General Permit, the Director shall issue the Verification of General Permit Conformance (approval of Septic System) only if the site plan accurately reflects the final location and configuration of the components of the treatment and disposal works.

## **SITE INVESTIGATION**

**A310.B.** The investigator shall perform a site investigation if an on-site wastewater treatment facility is proposed for installation. The applicant **shall submit the following information** in a format prescribed by the Department and shall provide sufficient data to:

1. Determine if any of the following limiting conditions exist:
  - a) The soil absorption rate determined by the requirements of this Article is more than 1.20 gallons per square foot per day; *(1 – 3 minutes per inch)*
  - b) The soil absorption rate determined by the requirements of this Article is less than 0.13 gallons per square foot per day; *(120 minutes per inch)*
  - c) The vertical separation distance from the bottom of the lowest point of the disposal system to the seasonal high water table is less than the minimum vertical separation specified by A312(E), or seasonal saturation at the surface occurs;
  - d) The surface slope is greater than 15% at the intended location of the on-site wastewater treatment facility;
  - e) Minimum setback distances are not within acceptable limits as specified by A312(C);
  - f) The vertical separation distance from the bottom of the lowest point of the disposal system to a subsurface condition that will cause surfacing of wastewater at the design flow rate or provide a direct conduit to the aquifer is less than the minimum vertical separation specified by A312(E);
  - g) Surface drainage characteristics at the intended location of the on-site wastewater treatment facility will adversely affect the ability of the facility to function properly; or
  - h) The vertical separation distance from the bottom of the lowest point of the disposal system to a subsurface condition that will convey wastewater to a water of the state to cause or contribute to a violation of an Aquifer Water Quality Standard established under A.R.S. Title 49, Chapter 2, Article 2 is less than the minimum vertical separation specified under A312(E).
2. Allow selection of an appropriate on-site wastewater treatment facility for the site considering all limiting conditions that exist.
3. Effectively locate, design, and install a properly operating on-site wastewater treatment facility to serve the anticipated development at the site, whether or not limiting conditions exist.

**A310.C. Soil Investigation** The site investigation shall include the determination of soil characteristics using one or more of the following methods:

1. "Standard Practice for Surface Site Characterization for On-Site Septic Systems" published by the American Society for Testing and Materials, (D 5879-95<sup>E1</sup>), approved December 10, 1995;
2. "Standard Practice for Subsurface Site Characterization of Test Pits for On-Site Septic Systems," published by the American Society for Testing and Materials, (D 5921-96<sup>E1</sup>), approved February 10, 1996;
3. "Standard Practice for Soil Investigation and Sampling by Auger Borings," published by the American Society for Testing and Materials, (D 1452-80), re-approved 1995, if the depth to groundwater may be within the required minimum vertical separation from the bottom of the disposal field.
  - a) The information listed in subsections (C)(1), (C)(2) and (C)(3) is incorporated by reference and does not include any later amendments or editions of the incorporated matter.
  - b) Copies of the incorporated material are available for inspection at the Department of Environmental Quality and the Office of the Secretary of State, or may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, Conshohocken, PA 19428-2959.
4. Percolation testing as specified in subsection (E);
5. Seepage pit performance testing as specified in subsection (F);
6. Other methods of soil evaluation, as approved by the Department, that ensure compliance with Aquifer Water Quality Standards through proper system location, selection, design, installation, and operation.

**A310.D. Applicability of Soil Characterization Methods**

1. Soil characterization using one or more of the American Society for Testing and Materials methods specified in subsections A310.C(1),(2), and (3) shall be used if one or more of the following site conditions exists:
  - a) The natural surface slope at the intended location of the on-site wastewater treatment facility, including the disposal field reserve area, is greater than 15%;
  - b) Bedrock or similar consolidated rock formation that cannot be excavated with a shovel outcrops from the lot or is known to exist less than 10 feet below the land surface;
  - c) The native soil at the surface or encountered in a boring, trench, or hole consists of more than 35% rock fragments greater than three inches across; or
  - d) The seasonal high water table is known to occur within 10 feet of the natural land surface or seasonal saturation at the natural land surface occurs as indicated by soil mottling, vegetation adapted to near-surface soils, nearby springs, seeps, or surface water bodies, or well records that indicate high water table conditions beneath the intended location;
  - e) A percolation test yields results outside the limits specified in subsection (B)(1)(a) and (B)(1)(b).
2. Percolation testing as specified in subsection (C)(4) or another method of soil evaluation approved by the Department under subsection (C)(6) may be used to augment soil characterization specified in subsection (D)(2) if useful to locate or design an on-site wastewater treatment facility.
3. Percolation testing as specified in subsection (C)(4) or another method of soil evaluation approved by the Department under subsection (C)(6) shall be used as the sole method of soil characterization if a soil characterization method specified in subsection (D)(2) is not required.
4. Unless testing under subsection (C)(5) is required, the Department shall accept a soil characterization method specified in subsection (D)(2) as the sole soil characterization method.

### **A310.E Percolation Testing**

1. **Planning and Preparation** The investigator shall:
  - a) Select a sufficient number of sites for percolation testing to provide adequate and credible information to ensure proper location, selection, design, and installation of a properly working on-site wastewater treatment facility and reserve drainfield. At least two sites shall be selected, one in the primary disposal area and one in the reserve disposal area;
  - b) Perform percolation testing at each site at appropriate depths within the soil profile to establish the absorption capability of the soil in the primary and reserve disposal areas and to help determine the vertical separation necessary to achieve effective wastewater treatment in the zone of unsaturated flow below the drainfield system. The investigator shall perform percolation tests at multiple depths if there is an indication of an obvious change in soil characteristics that appreciably affect the location, selection, design, installation, or disposal performance of the on-site wastewater treatment facility. The bottom of the percolation test hole is the reference elevation and depth for record keeping;
  - c) Excavate percolation test holes in undisturbed soil at least 12 inches deep with a cross section of 12 inches square, if square, or a diameter of 15 inches, if round. The investigator shall not alter the structure of the soil during the excavation;
  - d) Place percolation test holes away from site or soil features that yield unrepresentative or misleading data pertaining to the location, selection, design, installation, or performance of the on-site wastewater treatment facility;
  - e) Scarify smeared soil surfaces within the percolation test holes and remove any loosened materials from the bottom of the hole; and
  - f) Use buckets with holes in the sides to support the sidewalls of the percolation test hole, if necessary. Any voids between the walls of the hole and the bucket shall be filled with pea gravel to reduce the impact of the enlarged hole.
2. **Pre-soaking Procedure** The investigator shall:
  - a) Fill the percolation test hole to a depth of 12 inches above the bottom of the hole with clean water;
  - b) Observe the decline of the water level in the hole and record time in minutes for the water to completely drain away;
  - c) Repeat the steps specified in subsection (E)(2)(a) and (E)(2)(b) if the water drains away in less than 60 minutes. If the water drains away the second time in less than 60 minutes, the inspector shall repeat the steps specified in subsections (E)(2)(a) and (E)(2)(b) again. If the water drains away again in less than 60 minutes, the percolation test shall be performed following subsection (E)(3); and
  - d) Add clean water to the hole after 60 minutes and maintain the water at a minimum depth of nine inches for at least four more hours if the water drains away in 60 minutes or greater. The inspector shall protect the hole from precipitation and runoff, and the percolation test specified in subsection (E)(3) shall be performed between 16 and 24 hours after pre-soaking.
3. **Conducting the Test** The investigator shall:
  - a) Conduct the percolation test before soil hydraulic conditions established by the pre-soaking procedure substantially change. Any loose materials in the percolation test hole shall be removed to ensure that the specified dimensions of the hole are maintained and the infiltration surfaces are undisturbed native soil;
  - b) Fill the test hole to a depth of six inches above the bottom with clean water.
  - c) Observe the decline of the water level in the percolation test hole and determine and record the time in minutes for the water level to fall exactly one inch from a fixed reference point. The investigator shall immediately refill the hole with clean water to a depth of six inches above the bottom, and shall determine and record the time in minutes for the water level to fall exactly one inch. The hole again shall be immediately refilled with clean water to a depth of six inches above the bottom and the time for the water to fall exactly one inch shall be determined and recorded. The investigator shall ensure that the method for measuring water

- level depth is accurate and does not significantly affect the percolation rate of the test hole;
- d) Use the stabilized percolation rate as the basis for design if, when three consecutive measurements vary by no more than 10%. If three consecutive measurements indicate that the percolation rate results are not stabilizing or the percolation rate is between 60 and 120 minutes per inch, an alternate method based on a graphical solution of the test data shall be used to approximate the stabilized percolation rate; and
- e) Record the percolation rate results in minutes per inch. The submittal of percolation test results to the Department shall include a log of the soil formations encountered; the percent of rock fragments; the depth to groundwater; whether and which test hole was reinforced with a bucket; and locations and depths or elevations of the percolation test holes on the site investigation map.

**A310.G Soil Evaluation Procedures** Soil evaluation procedures. If one or more of the soil evaluation procedures specified by subsection A310.(C)(1), (C)(2), or (C)(3) are used, the following rules apply and the investigator shall:

1. Ensure that the number of test locations selected for soil evaluation is sufficient to provide adequate and credible information to ensure proper location, selection, design, and installation of a properly working on-site wastewater treatment facility and reserve drainfield. The investigator shall select at least two test locations, one in the primary disposal area and one in the reserve disposal area;
2. Perform a soil evaluation at each test location at appropriate depths within the soil profile to establish the capability of the soil in the primary and reserve disposal areas to absorb wastewater, and determine the vertical separation necessary to achieve effective wastewater treatment in the zone of unsaturated flow below the drainfield system;
3. Not conduct soil evaluations near site or soil features that yield unrepresentative or misleading data relating to the location, selection, design, installation, or performance of the on-site wastewater treatment facility;
4. Include the following in a soil evaluation:
  - a) A log of soil formations for each test location with information on soil type, texture, and classification; percentage of rock; structure; consistence; and mottles;
  - b) A determination of depth to ground water below the land surface by test holes, published groundwater data, subdivision reports, or relevant well data; and
  - c) A determination of the water absorption characteristics of the soil, under A312.D(2)(b), sufficient to allow location and design of the on-site wastewater treatment facility.

## **FACILITY SELECTION**

**A311.A** A person seeking to install an on-site wastewater treatment facility described in E302 may install the facility if the site investigation conducted under A310 indicates that none of the limiting site conditions described in A310(B) exist at the site, except as provided in subsection (C).

1. The Notice of Intent to Discharge shall specify that none of the limiting site conditions described in A310(B) were identified at the site.

**A311.B** The on-site wastewater treatment facility for the site shall be selected, designed, and installed to overcome the identified site limitations.

1. On-site treatment and disposal systems and technologies covered by Type 4 General Permits may be used alone or in combination to overcome the site limitations.
2. An applicant may submit a single Notice of Intent to Discharge for a system consisting of components or technologies covered by multiple general permits if the information submittal requirements of all the general permits are met.
3. The Director shall, except in unusual circumstances, issue a single Provisional Verification of General Permit Conformance established under A301(D)(2) for the on-site wastewater treatment facility.



**A311.C** A person seeking to install an on-site wastewater treatment facility shall select a facility that is appropriate for the site's geographic location, setback limitations, slope, topography, soil classification, wastewater infiltration capability, and depth to seasonally high groundwater table or other limiting subsurface condition. An on-site wastewater treatment facility described in E302 shall not be used by itself at a site where limiting site conditions are identified, except the Department shall review and may approve a facility based on the procedures and conditions under A312(G) if no more than one of the limiting site conditions specified by A310(B)(1)(a), (B)(1)(b) or (B)(1)(d) exists.

**A311.D** If an on-site wastewater treatment facility, described in E302, is suitable for a site and no limiting site conditions prevent its proper installation and operation, the Department shall not approve a system other than that described in E302, unless the applicant supplies a statement with the Notice of Intent to Discharge justifying the use of a system not authorized under E302.

## **FACILITY DESIGN**

**A312.A** General design requirements. A person designing the on-site wastewater treatment facility shall:

1. Sign design documents submitted as part of the Notice of Intent to Discharge or subsequently to obtain a Provisional Verification of General Permit Conformance, including plans, specifications, drawings, reports, and calculations; and
2. Locate and design the on-site wastewater treatment facility project using good design judgement and rely on appropriate design methods and calculations.

**A312.C Setbacks.** The following setbacks apply unless the Department has authorized a different setback under the procedure specified in subsection (G), or has established a more stringent setback on a site-or area-specific basis to ensure compliance with water quality standards.

Feature of Potential Impact	Setback Distance (feet)	
	Septic Tank	Disposal Trench, Bed, or Seepage Pit
Building (1)	10	10
Property line shared with adjoining land <b>not served</b> by a common drinking water system or an existing well (2)	50	50
All other property lines	5	5
Water supply well (public or private)	100	100
Perennial or intermittent stream (3)	100	100
Lake or reservoir (4)	100	100
Drinking water intake from a surface water source (includes an open water body, downgrade spring or a well tapping stream-side saturated alluvium)	200	200

Drainage easement or wash with drainage area more than five acres (5)	50	50
Water main or branch water line	10	10
Domestic service water line (6)	5	5
Downslope cut banks and culvert or roadway ditches (7)	15	15
Driveway (8)	5	5
Swimming pool (9)	5	5
Easement (except drainage easement)	5	5

Notes:

- 1) Includes porches, decks, and steps (covered or uncovered), breeze-ways, roofed patios, carports, covered walks and driveways, and similar structures and appurtenances.
- 2) A common drinking water system is a system that currently serves or is under legal obligation to serve the property and may include a drinking water utility, a well sharing agreement, or other viable water supply agreement. A setback may be reduced to a minimum of five feet from the property line if:
  - a) The owners of any affected undeveloped adjacent properties agree by an appropriate written document to limit the location of any new well on their property to at least 100 feet from the proposed septic tank and primary and reserve disposal field areas; and
  - b) The arrangements and documentation are approved by the Department.
- 3) Measured from the limit of peak streamflow from a 10-year, 24-hour rainfall event.
- 4) Measured from the high water line from a 10-year, 24-hour rainfall event at the lake or reservoir.
- 5) Measured from the nearest edge of the defined natural channel bank or drainage easement whichever is less. A setback may be reduced to 25 feet if natural or constructed erosion protection is approved by the appropriate flood plain administrator.
- 6) The water line separation from sewer lines shall be as follows:
  - a) A water line crossing a sewer line at an angle of 45 to 90 degrees shall be one foot above the sewer line.
  - b) A water line crossing a sewer line at an angle of less than 45 degrees is not allowed.
  - c) A water line that is one to three feet from a sewer line but does not cross the sewer line shall be one foot above the sewer line and may be on a bench in the same trench or in a separate trench.
  - d) A water line that is less than one foot from a sewer line but does not cross the sewer line is not allowed.
- 7) Measured to the top of the cut bank or ditch or to the nearest sidewall of the culvert. The setback to a disposal trench, bed, or seepage pit is 15 feet or four times the elevation difference between the finished grade of the disposal trench, bed, or seepage pit and the elevation at the cut bank bottom, ditch bottom, or culvert invert, whichever is greater, up to 50feet.
- 8) Measured to the nearest edge of septic tank excavation. A properly reinforced septic tank and cover may be placed at any location relative to a driveway if access openings, risers, and covers carry the design load and are protected from inflow.
- 9) A setback may be increased due to soil loading and stability concerns.

**A312.D Soil absorption rate (SAR) and disposal field sizing**

1. If soil characterization and percolation test methods yield different SAR values or if multiple applications of the same approach yield different values, the designer of the disposal field shall use the most conservative value unless a less conservative value is proposed and justified to the Department's satisfaction in the Notice of Intent to Discharge.
2. The maximum SAR used to calculate disposal field size for systems described in E302 is as follows:
  - a) The SAR by percolation testing as described in A310(E)(3) for shallow and deep disposal fields is determined from the results of percolation tests:

<b>Percolation Rate From Percolation Test (minutes per inch)</b>	<b>SAR, Shallow Disposal Field (gal/day/ft<sup>2</sup>)</b>	<b>SAR, Deep Disposal Field (gal/day/ft<sup>2</sup>)</b>
Less than 1.00	See Note	See Note
1.00 to less than 3.00	1.20	0.93
3.00	1.10	0.73
4.00	1.00	0.67
5.00	0.90	0.60
7.00	0.75	0.50
10.0	0.63	0.42
15.0	0.50	0.33
20.0	0.44	0.29
25.0	0.40	0.27
30.0	0.36	0.24
35.0	0.33	0.22
40.0	0.31	0.21
45.0	0.29	0.20
50.0	0.28	0.19
55.0	0.27	0.18
55.0+ to 60.0	0.25	0.17
60.0+ to 120	0.20	0.13
Greater than 120	See Note	See Note

Note: A disposal field described in E302 is not allowed unless approved by the Department under A311.C.

- b) The maximum SAR for shallow and deep disposal fields using the soil evaluation method described in A310(G) is determined by answering the questions in the following table. The questions are read in sequence starting with “A.” The first “yes” answer determines the maximum SAR used to calculate disposal field size for systems described in E302.

<b>Sequence of Soil Characteristics Questions</b>	<b>SAR, Shallow Disposal Field System (gallons per day per square foot)</b>	<b>SAR, Deep Disposal Field System (gallons per day per square foot)</b>
A. Is the horizon gravelly coarse sand or coarser?	See Note	See Note
B. Is the structure of the horizon moderate or strongly platy?	See Note	See Note
C. Is the texture of the horizon sandy clay loam, clay loam, silty clay loam, or finer and the soil structure weak platy?	See Note	See Note
D. Is the moist consistency stronger than firm or any cemented class?	See Note	See Note
E. Is the texture sandy clay, clay, or silty clay of high clay content and the structure massive or weak?	See Note	See Note
F. Is the texture sandy clay loam, clay loam, silty clay loam, or silty loam and the structure massive?	See Note	See Note
G. Is the texture of the horizon loam or sandy loam and the structure massive?	0.20	0.13
H. Is the texture sandy clay, clay or silty clay of low clay content and the structure moderate or strong?	0.20	0.13
I. Is the texture sandy clay loam, clay loam, or silty clay loam and the structure weak?	0.20	0.13
J. Is the texture sandy clay loam, clay loam, or silty clay loam and the structure moderate or strong?	0.40	0.27
K. Is the texture sandy loam, loam, or silty loam and the structure weak?	0.40	0.27
L. Is the texture sandy loam, silt loam and the structure moderate or strong?	0.60	0.40
M. Is the texture fine sand, very fine sand, loamy fine sand, or loamy very fine sand?	0.40	0.27
N. Is the texture loamy sand or sand?	0.80	0.53
O. Is the texture coarse sand?	1.20	See Note

Note: A disposal field described in E302 is not allowed, unless by the Department under A311.C and an applicable SAR is provided.

- c) For subsections (D)(2)(a) and (D)(2)(b), a shallow disposal field has a maximum depth below finished grade of five feet or less and a deep disposal field has a depth below finished grade of more than five feet.

**A312.E Minimum Vertical Separation**

1. The minimum vertical separation from the bottom of the lowest point of the disposal system to the top of the nearest limiting subsurface condition described in A310(B)(1)(c), (B)(1)(f), and (B)(1)(I) for on-site wastewater treatment facilities described in E302, is dependent on the soil absorption rate and is determined as follows:

MAXIMUM SOIL ABSORPTION RATE (gallons per day per square foot)			MINIMUM VERTICAL SEPARATION (feet)	
Shallow Disposal Field	Deep Disposal Field	Seepage Pit	Shallow or Deep Disposal Field	Seepage Pit
1.20+	0.93+	1.20+	Not allowed for septic tank effluent	Not Allowed
0.63+ to 1.20	0.42 to 0.93	0.63+ to 1.20	10	60
0.20 to 0.63	0.13 to 0.42	0.36 to 0.63	5	25
Less than 0.20	Less than 0.13	Less than 0.36	Not allowed for septic tank effluent	Not Allowed

2. The allowable minimum vertical separation from the bottom of the constructed disposal field to the top of the nearest limiting subsurface condition is dependent on the ability of the facility to reduce the level of harmful microorganisms, expressed as total coliform in colony forming units per 100 milliliters (cfu/100 ml) delivered to native soil below the disposal works at least 95% of the time. A treatment works, disposal works, or a combination of these works that achieves a treatment level specified in the following table may be used to determine the corresponding minimum vertical separation.

**A312.G Alternative design, installation, or operational features** When a person submits a Notice of Intent to Discharge, the person may request that the Department review and approve a feature of improved or alternative technology, design, setback, installation, or operation that differs from a general permit requirement in this Article.

- The person shall make the request for an alternative feature of technology, design, installation, or operation on a form provided by the Department and include:
  - A description of the requested change;
  - A citation to the applicable design, installation, or operational requirement for which the change is being requested; and
  - Justification for the requested change, including any necessary supporting documentation.
- The person shall submit the appropriate fee specified under 18 A.A.C. 14 for each requested change. For calculating the fee, a requested change that is applied multiple times in a similar manner throughout the facility is considered a single request if submitted for concurrent review.
- The person shall provide sufficient information for the Department to determine that the change achieves equal or better performance compared with the general permit requirement, or addresses site or system conditions more satisfactorily than the requirements of this Article.

4. The Department shall review and may approve the request for change.
5. The Department shall deny the request for the change if the change adversely affects other permittees or causes or contributes to a violation of an Aquifer Water Quality Standard.
6. The Department shall deny the request for the change if the change:
  - a) Fails to achieve equal or better performance compared to the general permit requirement,
  - b) Fails to address site or system conditions more satisfactorily than the general permit requirement,
  - c) Is insufficiently justified based on the information provided in the submittal,
  - d) Requires excessive review time, research, or specialized expertise by the Department to act on the request, or
  - e) For any other justifiable cause.

## **FACILITY INSTALLATION AND OPERATIONAL MAINTENANCE PLAN**

**A313.A Facility Installation** In addition to installation requirements in the general permit, the applicant shall ensure that the following tasks are performed, as applicable:

1. The facility is installed as described in design documents submitted with the Notice of Intent to Discharge (Septic System Permit);
2. Components are installed on a firm foundation that supports the components and operating loads;
3. The site is prepared to protect native soil beneath the soil absorption area and in adjacent areas from compaction, prevent smeared absorption surfaces, minimize disturbances from grubbing, and otherwise preclude damage to the disposal area that would impair performance;
4. Components are protected from damage at the construction site and installed in conformance with the manufacturer's instructions if consistent with this Article;
5. Treatment media is placed to achieve uniform density, prevent differential settling, produce a level inlet surface unless otherwise specified, and avoid introduction of construction contaminants;
6. Backfill is placed to prevent damage to geotextile, liner materials, tanks, and other components;
7. Soil cover is shaped to shed rainfall away from the backfill areas and prevent ponding of runoff; and
8. Anti-buoyancy measures are implemented during construction if temporary saturated backfill conditions are anticipated during construction.

**A313.B Operation and Maintenance** In addition to operation and maintenance requirements in the general permit or specified in the Operation and Maintenance Plan, the permittee shall perform the following tasks as applicable:

1. Inspect and clean pretreatment and wastewater distribution components;
2. Clean or backwash any effluent filters, and return cleaning water to the pretreatment head works;
3. Inspect and clean the effluent baffle screen and pump tank, and properly dispose of cleaning residue;
4. Clean the dosing tank effluent screen, pump switches, and floats, and properly dispose of cleaning residue;
5. Flush lateral lines and return flush water to the pretreatment head works;
6. Inspect, remove and replace, if necessary, and properly dispose of filter media;
7. Rod pressurized wastewater delivery lines and secondary distribution lines (for dosing systems), and return cleaning water to the pretreatment head works;
8. Inspect and clean pump inlets and controls and return cleaning water to the pretreatment head works;
9. Implement corrective measures if anomalous ponding, dryness, noise, odor, or differential settling is observed; and

10. Inspect and monitor inspection and access ports, as applicable, to verify that operation is within expected limits for:
  - a) In fluent wastewater quality;
  - b) Pressurized dosing system operation;
  - c) Aggregate infiltration bed and mound system operation and performance;
  - d) Wastewater delivery and engineered pad operation and performance;
  - e) Pressurized delivery system, filter, under drain, and native soil absorption system operation and performance;
  - f) Saturation condition status, operation and performance in peat and other media; and
  - g) Treatment system components.

## **TANK DESIGN, MANUFACTURING, AND INSTALLATION**

**A314.A** A septic tanks manufacturer shall assure that septic tanks approved for installation under this Article are;

1. Designed to produce a clarified effluent and provide adequate space for sludge and scum accumulations;
2. Watertight and constructed of solid durable materials not subject to excessive corrosion or decay;
3. Manufactured with at least two compartments unless two separate structures are placed in series. The manufacturer shall ensure that:
  - a) The inlet compartment of any septic tank not placed in series is nominally 67% to 75% of the total required capacity of the tank,
  - b) Septic tanks placed in series are considered a unit and meet the same criteria as a single tank,
  - c) The liquid depth of the septic tank is at least 42 inches,
  - d) A septic tank of 1000 gallon capacity is at least eight feet long and the tank length of septic tanks of greater capacity is at least two times but not more than three times the width.
4. Provided with at least two access openings to the tank interior, each at least 20 inches in diameter. The manufacturer shall ensure that:
  - a) One access opening is located over the inlet end of the tank and one access opening is located over the outlet end,
  - b) Whenever a first compartment exceeds 12 feet in length, another access opening is provided over the baffle wall,
  - c) Access openings and risers are constructed to ensure accessibility within six inches below finished grade.
5. Manufactured so that the sewage inlet and wastewater outlet openings are not less in size than the connecting sewer pipe. The manufacturer shall ensure that:
  - a) The vertical leg of round inlet and outlet fittings is at least four inches but not less in size than the connecting sewer pipe,
  - b) A baffle fitting has the equivalent cross-sectional area of the connecting sewer pipe and not less than a four inch horizontal dimension if measured at the inlet and outlet pipe inverts.
6. Manufactured so that the inlet and outlet pipe or baffle extends four inches above and at least 12 inches below the water surface when the tank is installed according to the manufacturer's instructions consistent with this Chapter. The invert of the inlet pipe shall be at least two inches above the invert of the outlet pipe.
7. Manufactured so that the inlet and outlet fittings or baffles and compartment partitions have a free vent area equal to the required cross-sectional area of the connected sewer pipe to provide free ventilation above the water surface from the disposal field or seepage pit through the septic tank, house sewer, and stack to the outer air;
8. Manufactured so that the side walls extend at least 12 inches above the liquid depth and the cover of the septic tank is at least two inches above the top of the inlet fitting vent opening;
9. Manufactured so that partitions or baffles between compartments are of solid durable material

(wooden baffles are prohibited) and extend at least four inches above the liquid level. The manufacturer shall ensure that the open area of the baffle is between one and two times the open area of the inlet pipe or horizontal slot and located at the midpoint of the liquid level of the baffle. If a horizontal slot is used, the slot shall be no more than six inches in height;

10. Structurally designed to withstand all anticipated earth or other loads. The manufacturer shall ensure that:
  - a) All septic tank covers are capable of supporting an earth load of 300 pounds per square foot;
  - b) If the top of the tank is greater than two feet below finish grade, the septic tank and cover are capable of supporting an additional load of 150 pounds per square foot for each additional foot of cover;
11. Manufactured or installed so that the influent and effluent ends of the tank are clearly and permanently marked on the outside of the tank with the words "INLET" or "IN," and "OUTLET" or "OUT," above or to the right or left of the corresponding openings.
12. Clearly and permanently marked with the manufacturer's name or registered trademark, or both, the month and year of manufacture, the maximum recommended depth of earth cover in feet, and the design liquid capacity of the tank. The manufacturer shall protect the markings from corrosion so that they remain permanent and readable for the usable life of the tank.

**A314.B Materials used to construct or manufacture septic tanks.**

1. A person constructing a concrete septic tank cast-in-place at the site of use shall protect the tank from corrosion by coating the tank with a bituminous coating, constructing the tank using a concrete mix that incorporates 15% to 18% fly ash, or other Department-approved means. The manufacturer shall ensure that:
  - a) The coating extends at least four inches below the wastewater line and covers all of the internal area above that point;
  - b) A septic tank cast-in-place complies with the "Building Code Requirements for Structural Concrete (ACI 318-99) and Commentary (ACI 318R-99)," published by the American Concrete Institute, June 1999; and the "Environmental Engineering Concrete Structures (ACI 350R-89)," published by the American Concrete Institute, January 2000. This material is incorporated by reference and does not include any later amendments or editions of the incorporated matter. Copies of the incorporated material are available for inspection at the Department of Environmental Quality and the Office of the Secretary of State, or may be obtained from American Concrete Institute, P.O. Box 9094, Farmington Hills, MI 48333-9094.
2. A septic tank manufacturer shall ensure that a steel septic tank has a minimum wall thickness of No. 12 U.S. gauge steel and is protected from corrosion, internally and externally, by a bituminous coating or other Department-approved means.
3. A septic tank manufacturer shall ensure that a prefabricated concrete septic tank complies with the "Standard Specification for Precast Concrete Septic Tanks," published by the American Society for Testing and Materials, © 1227-00), approved January 10, 2000. This information is incorporated by reference and does not include any later amendments or editions of the incorporated matter. Copies of the incorporated material are available for inspection at the Department of Environmental Quality and the Office of the Secretary of State, or may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, Conshohocken, PA 19428-2959.
4. A septic tank manufacturer shall ensure that materials for fiberglass or polyethylene septic tanks comply with the "Material and Property Standards for Prefabricated Septic Tanks," published by the International Association of Plumbing and Mechanical Officials, (IAPMO PS 1-99), revised January 1999. This information is incorporated by reference, does not include any later amendments or editions of the incorporated matter, and is on file with the Office of the Secretary of State. The material may be viewed at the Arizona Department of Environmental Quality, Water Quality Division, or obtained from International Association of Plumbing & Mechanical Officials, 20001 E. Walnut Drive, South, Walnut, CA 91789-2825.



**A314.C** If any conflict exists between this Article and the information incorporated by reference in subsections (B)(3) and (B)(4), the requirements of this Article apply. The Department may approve septic tanks constructed of alternative materials under A312(G). Tanks constructed of wood, block, or bare steel are prohibited. The Department may inspect septic tanks at the site of manufacturing to verify compliance with subsections (A) through (C).

**A314.D** An applicant shall select a septic tank with a design liquid capacity as follows:

1. For a single residence, the design liquid capacity of a septic tank is governed by the following table:

No. of Bedrooms	No. of Occupants	No. of Baths	Maximum Fixture Count	Minimum Septic Tank Size (gallons)
2	4	1-2	18	1000
3	6	1-2	18	1000
4	8	2-3	25	1250
5	10	2-4	32	1500
6	12	3-5	39	2000
7	14	3-5	42	2000

2. For other than a single residence, the recommended design liquid capacity of a septic tank in gallons is 2.1 times the design flow into the tank as determined from *Table 1, Unit Daily Design Flows*.
3. An applicant may place septic tanks in series to meet the septic tank design liquid capacity requirements.

**A314.E New or replacement septic tank installation. An applicant shall:**

1. Provide permanent surface markers for locating the septic tank access openings for maintenance;
2. Ensure that septic tanks installed under concrete or pavement have the required access openings extended to grade;
3. Install a septic tank effluent filter on all septic tanks. The applicant shall ensure that the filter:
  - a) Prevents the passage of solids larger than 1/8 inch in diameter while under two feet of hydrostatic head; and
  - b) Is constructed of materials that are resistant to corrosion and erosion and sized to accommodate hydraulic and organic loading.
4. Test cast-in-place septic tanks and multi-part septic tanks assembled and sealed at the site of use for watertightness after installation by the water test or the vacuum test and repair, if necessary.
  - a) Water test:
    - I. The applicant shall ensure that the tank is filled with clean water to the invert of the outlet and the water left standing in the tank for 24 hours. The applicant shall:
      - 1) After 24 hours, refill the tank to the invert, if necessary;
      - 2) Record the initial water level and time; and
      - 3) After one hour, record the water level and time;
    - II. The tank passes the water test if the water level dropped less than ¼ inch over the one hour period. Any visible leak of flowing water is considered a failure. A damp or wet spot that is not flowing is not considered a failure.

- b) Vacuum test:
  - I. The applicant shall:
    - 1) Seal the empty tank,
    - 2) Apply and stabilize a vacuum if two inches of mercury, and
    - 3) Monitor the vacuum for one hour.
  - II. The tank passes the vacuum test if the mercury level dropped no more than 0.2 inches over the one hour period.

### **TRANSFER INSPECTION (Effective January 1, 2002)**

**A316.A** A person possessing working knowledge of the type of facility and the inspection process shall perform a transfer inspection of an on-site wastewater treatment facility.

**A316.B** The applicant shall send the Report of Inspection and Notice of Transfer forms required by A304 and approved by the Department, and any applicable fee to the health or environmental agency delegated by the Director to administer the on-site wastewater treatment facility program.

- 1. The Report of Inspection shall:
  - a) Indicate that the on-site wastewater treatment facility was inspected within six months before the deed of transfer for the property was recorded, and
  - b) Address the physical and operational condition of the on-site wastewater treatment facility and identify associated deficiencies.
- 2. A copy of the Report of Inspection shall be transmitted to the buyer of the property.

**A316.C** This Section does not apply to the first sale of a house or property from a developer or subdivider to the buyer of the property.

### **INSTALLATION REQUIREMENTS**

#### **E302.C**

- 1. **General Provisions** The applicant shall:
  - a) Ensure that the septic tank meets the requirements specified in A314.
  - b) Before placing aggregate or drain lines in a prepared excavation, remove all smeared or compacted surfaces from trenches by raking to a depth of one inch and removing loose material. The applicant shall:
    - I. Place aggregate in the trench to the depth and grade specified in subsection (C)(2);
    - II. Place the drain pipe on aggregate and cover it with aggregate to the minimum depth specified in subsection (C)(2); and
    - III. Cover the aggregate with landscape filter material, geotextile, or similar porous material to prevent filling of voids with earth backfill;
  - c) Use a grade board stake placed in the trench to the depth of the aggregate if the distribution line is constructed of drain tile or flexible pipe that will not maintain alignment without continuous support;
  - d) If two or more drain lines are installed, install a distribution box approved by the Department of sufficient size to receive all lateral lines and flows at the head of each disposal field. The applicant shall:
    - I. Ensure that the inverts of all outlets are level and the invert of the inlet is at least one inch above the outlets;
    - II. Design distribution boxes to ensure equal flow and install the boxes on a stable level surface such as a concrete slab or native or compacted soil; and

- III. Protect concrete distribution boxes from corrosion by coating them with an appropriate bituminous coating, constructing the boxes with concrete that has a 15 to 18% fly ash content, or by using other allowable means;
- e) Construct all lateral pipes running from a distribution box to the disposal field with watertight joints and ensure that multiple disposal field laterals, wherever practical, are of uniform length;
- f) Lay pipe connections between the septic tank and a distribution box on natural ground or compact fill and construct the pipe connections with watertight joints;
- g) Construct steps within distribution line trenches or beds, if necessary, to maintain a level disposal pipe on sloping ground. The lines between each horizontal section shall be constructed with watertight joints and installed on natural or unfilled ground; and
- h) Ensure that a disposal field consisting of trenches, beds, chamber technology, or seepage pits is not paved over or covered by concrete or any material that can reduce or inhibit possible evaporation of wastewater through the soil to the land surface.

2. **Shallow and Deep Trenches**

- a) The applicant may, in computing the trench bottom absorption, include a trench sidewall area between 12 and 36 inches below the distribution line.
- b) The applicant shall ensure that trench bottoms are level. The applicant shall calculate trench sizing for shallow and deep trenches from the soil absorption rate specified under R18-9-A312(D).
- c) The following design criteria for shallow and deep trenches apply:

<b>Shallow and Deep Trenches</b>	<b>Minimum</b>	<b>Maximum</b>
Number of trenches	1 (2 are recommended)	---
Length of trench	---	100 feet
Bottom width of trench	12 inches	36 inches
Depth of cover over distribution pipe	9 inches	24 inches <sup>1</sup>
Aggregate material under pipe	12 inches	---
Aggregate material over pipe	2 inches	2 inches
Slope of distribution pipe	Level	Level
Distribution pipe diameter	3 inches	4 inches
Spacing of distribution pipe	2 times effective depth <sup>2</sup> or five feet, whichever is greater	---

- NOTES:
- a. For more than 24 inches, SDR 35 or equivalent strength pipe is required.
  - b. The distance between the bottom of the distribution pipe and the bottom of the trench bed.

3. **Beds** An applicant shall:

- a) If a bed is installed instead of a trench, ensure that the area of each bed is at least 50% greater than the tabular dimensions required for a trench. The applicant may, in computing the bed bottom absorption area, include a perimeter sidewall area between 12 and 36 inches below the distribution line.
- b) Ensure that the bottom of a bed is level and calculate bed sizing from the soil absorption rate as specified by A312(D).

c) The following design criteria for beds apply:

<b>Gravity Beds</b>	<b>Minimum</b>	<b>Maximum</b>
Number of distribution pipes	2	---
Length of bed	---	100 feet
Distance between pipes	4 feet	6 feet
Width of bed	10 feet	12 feet
Distance from pipe to sidewall	3 feet	3 feet
Depth of cover over pipe	9 inches	14 inches
Aggregate material under pipe	12 inches	---
Aggregate material over pipe	2 inches	2 inches
Slope of distribution pipe	Level	Level
Distribution pipe diameter	3 inches	4 inches

4. **Disposal field using chamber technology** An applicant shall:

- a) If leaching chambers are proposed instead of trenches or beds installed with distribution pipes, calculate an equivalent effective chamber absorption area to size the disposal field area and the number of chambers needed. The effective absorption area of each chamber is calculated as follows:

$$A = (1.43 \times B \times L) + (2 \times V \times L)$$

- I. "A" is the effective absorption area of each chamber,
  - II. "B" is the nominal width of the open bottom absorption surface of the chamber,
  - III. "V" is the vertical height of the chamber sidewall, and
  - IV. "L" is the length of the chamber.
- b) Calculate the disposal field size and number of chambers from the effective absorption area of each chamber and the soil absorption rates specified in A312(D), taking care to use the appropriate value, depending on whether the proposed chamber installation is shallow or deep. Example calculations for effective chamber absorption area, disposal field size, and number of required chambers are on file with the Department.
- c) Ensure that the sidewall of the chamber provides at least 35% open area for sidewall credit and that the design and construction minimizes the movement of fines into the chamber area. The use of filter fabric or geotextile against the sidewall openings is prohibited.